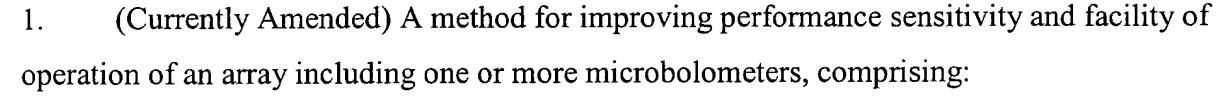
AMENDMENT AND RESPONSE UNDER 37 CFR § 1.116 – EXPEDITED PROCEDURE

Serial Number: 09/800366 Filing Date: March 6, 2001

Title: IMPROVED BOLOMETER OPERATION USING FAST SCANNING

Dkt: H0001512 (256.087US1)

IN THE CLAIMS



applying two or more bias pulses substantially sequentially during a frame time to each microbolometer [of the microbolometers] in the array;

measuring two or more resulting signals corresponding to the <u>two or more</u> bias pulses; computing an average signal value from the <u>two or more</u> resulting signals corresponding to each <u>microbolometer</u> [of the microbolometers] in the array during the frame time; and producing an output signal based on the computed average signal value for each <u>microbolometer</u> [of the microbolometers] in the array during the frame time.

- 2. (Previously Amended) The method of claim 1, further comprising: repeating the applying, measuring, computing, and producing steps to compute output signals during each frame time.
- 3. (Previously Amended) The method of claim 2, further comprising:
 applying a corrective electrical signal to the output signal to correct for resistance nonuniformity between the one or more microbolometers in the array to obtain a substantially
 uniform output signal value.
- 4. (Currently Amended) The method of claim 3, further comprising: converting the substantially uniform output signal value associated with each microbolometer [of the microbolometers] in the array to a digital signal value.
- 5. (Currently Amended) The method of claim 4, further comprising:

 passing the digital signal value associated with each microbolometer [of the microbolometers] in the array through a digital image processor to correct for image defects.



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6. (Previously Amended) The method of claim 5, wherein the image defects comprises: image defects selected from the group consisting of fine offsets, gain non-uniformity, and dead pixels.

- 7. (Original) The method of claim 1, wherein the bias pulses are substantially equal in magnitude.
- 8. (Original) The method of claim 1, wherein the bias pulses are substantially equally spaced in time.
- 9. (Previously Amended) The method of claim 1, wherein the two or more bias pulses comprise:

two or more voltage bias pulses.

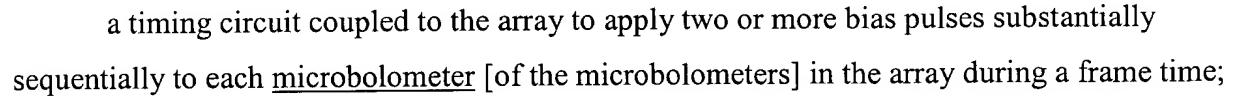
10. (Currently Amended) The method of claim 1, wherein the <u>two or more</u> resulting signals <u>comprises</u> [comprise]:

two or more [bias] current signals.

- 11. (Original) The method of claim 1, wherein the bias pulses are in the range of about 2 to 100 bias pulses.
- 12. (Original) The method of claim 1, wherein each of the two or more bias pulses has a time duration in the range of about 0.1 to 20 microseconds.
- 13. (Original) The method of claim 1, wherein the frame time is the time it takes for the array to produce a complete image of an object being viewed by the array.
- 14. (Currently Amended) An infrared radiation detector apparatus, comprising: microbolometers in an array;



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a measuring circuit coupled to the array to measure two or more resulting signals associated with each of the applied two or more bias pulses during the frame time;

a computing circuit coupled to the measuring circuit to compute an average signal value for each microbolometer [of the microbolometers] in the array from the measured two or more resulting signals during the frame time; and

an output circuit coupled to the computing circuit to produce an output signal based on the computed average signal value for each microbolometer [of the microbolometers] in the array during the frame time.

(Currently Amended) The apparatus of claim 14, wherein the output circuit further 15. comprises:

an integrator and an A/D converter to convert the output signal [value] to a digital signal value for each microbolometer [of the microbolometers] in the array.

(Currently Amended) The apparatus of claim 15, further comprising [wherein the 16. measuring circuit further comprises]:

a digital image processor, coupled to the output circuit to receive the digital signal value associated with each microbolometer [of the microbolometers] of the array and correct the received digital signal value for image defects.

(Currently Amended) The apparatus of claim 16, wherein the digital image processor 17. further comprises:

a correction circuit, to apply a corrective electrical signal based on a correction value to the output signal to correct for resistance non-uniformity in each microbolometer [of the microbolometers of the array] to obtain a uniform output signal value.

(Previously Amended) The apparatus of claim 17, wherein the correction circuit further 18. corrects the uniform output signal value for fine offsets, gain non-uniformity, or dead pixels.



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(Currently Amended) The apparatus of claim 18, wherein the digital image processor 19. further comprises:

digital memories to store correction values for each microbolometer [of the microbolometers] in the array.

- (Original) The apparatus of claim 14, wherein the two or more bias pulses are 20. substantially equal in magnitude.
- (Original) The apparatus of claim 20, wherein the two or more pulses are substantially 21. equally spaced in time.
- (Original) The apparatus of claim 14, wherein the two or more bias pulses are voltage 22. bias pulses.
- (Original) The apparatus of claim 22, wherein the resulting signals are current signals. 23.
- (Original) The apparatus of claim 14, wherein the two or more bias pulses are in the 24. range of about 2 to 100 bias pulses.
- (Original) The apparatus of claim 24, wherein the two or more bias pulses have time 25. duration in the range of about 0.1 to 20 microseconds.
- (Original) The apparatus of claim 14, wherein the frame time is the time it takes for the 26. array to produce a complete image of an object being viewed by the array.
- (Currently Amended) A signal processing electronics circuit for an array including one or 27. more microbolometers, comprising:

a timing circuit coupled to the array to apply two or more bias pulses substantially sequentially to each microbolometer [of the microbolometers] in the array such that the resulting Serial Number: 09/800366

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temperature in each <u>microbolometer</u> [of the microbolometers] in the array due to the application of the bias pulses is substantially uniform during a frame time;

a measuring circuit coupled to the array to measure two or more resulting signals, respectively associated with each of the applied bias pulses during the frame time;

a computing circuit coupled to the measuring circuit to compute an average signal value for each <u>microbolometer</u> [of the microbolometers] in the array from the measured resulting signals during the frame time; and

an output circuit coupled to the computing circuit to produce an output signal based on the computed average signal value for each <u>microbolometer</u> [of the microbolometers] in the array during the frame time.

28. (Canceled)

29. (Currently Amended) The circuit of claim <u>27</u> [28], wherein the output circuit further comprises:

an integrator and an A/D converter to convert the <u>output signal</u> [uniform output signal value] to a digital signal value for each <u>microbolometer</u> [of the microbolometers] in the array.

30. (Currently Amended) The circuit of claim 29, further comprising:

a digital image processor coupled to the output circuit to receive the digital signal value associated with each <u>microbolometer</u> [of the microbolometers of the array] to correct for image defects such as fine offsets, gain non-uniformity or dead pixels.

31. (Currently Amended) The circuit of claim 30, wherein the digital image processor further comprises:

a correction circuit to apply a corrective electrical signal based on a correction value to the output signal to correct for any resistance non-uniformity in each <u>microbolometer</u> [of the microbolometers of the array] to [a] obtain a uniform output signal value.



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32. (Previously Added) The circuit of claim 31, further comprising: a memory to store the correction value associated with each microbolometer in the array.



- 33. (Previously Added) The circuit of claim 27, wherein the two or more bias pulses are substantially equal in magnitude.
- 34. (Currently Amended) The circuit of claim 33, wherein the two or more <u>bias</u> pulses are substantially equally spaced in time.
- 35. (Previously Added) The circuit of claim 27, wherein the two or more bias pulses are voltage bias pulses.
- 36. (Previously Added) The circuit of claim 35, wherein the resulting signals are current signals.
- 37. (Previously Added) The circuit of claim 27, wherein the two or more bias pulses are in the range of about 2 to 100 bias pulses.
- 38. (Previously Added) The circuit of claim 37, wherein the two or more bias pulses have time duration in the range of about 0.1 to 20 microseconds.
- 39. (Previously Added) The circuit of claim 27, wherein the frame time is the time it takes for the array to produce a complete image of an object being viewed by the array.